1-1-2011

Maximizing Generalization in Severe Aphasia: Script Reading versus Scenario Training

Valerie Berg

NORTHERN ILLINOIS UNIVERSITY

Maximizing Generalization in Severe Aphasia: Script Reading Versus Scenario Training

A Thesis Submitted to the

University Honors Program

In Partial Fulfillment of the

Requirements of the Baccalaureate Degree

With Upper Division Honors

Department Of

School of Allied Health & Communicative Disorders

By

Valerie Berg

DeKalb, Illinois

May 2011

University Honors Program

Capstone Approval Page

Capstone Title

Maximizing Generalization in Severe Aphasia: Script Reading Versus Scenario Training.

Student Name Valerie Berg

Faculty Supervisor Jamie Mayer, Ph.D., CCC-SLP

Faculty Approval Signature

Department of Communicative Disorders

Date of Approval 05/10/11

HONORS THESIS ABSTRACT
THESIS SUBMISSION FORM

AUTHOR: Valerie Berg

THESIS TITLE: Maximizing Generalization in Severe Aphasia: Script Reading Versus Scenario Training

ADVISOR: Jamie Mayer, Ph.D., CCC-SLP

ADVISOR'S DEPARTMENT: Allied Health and Communicative Disorders

DISCIPLINE: Speech-Language Pathology YEAR: 2011

PAGE LENGTH: 26 pages

BIBLIOGRAPHY: Yes

ILLUSTRATED: No

PUBLISHED: No

LIST PUBLICATION: N/A

COPIES AVAILABLE: Hard Copy

ABSTRACT:

The purpose of this study was to compare two treatment protocols, script reading (Holland, 2010) versus a novel intervention protocol, scenario training, for an individual with severe aphasia. A single-subject, multiple-baseline-across behaviors, alternating treatment design was used to determine which treatment protocol would engender the most improvement in functional expressive language. Typically, the most difficult aspect of aphasia treatment protocols – especially for those with severe aphasia - is

generalization of treatment gains outside of the therapy room. Therefore, we designed scenario training to increase contextual relevance and hence generalization by rehearsing linguistic, motoric, cognitive aspects of particular situations. We trained sequentially the language for three functional tasks using both script and scenario protocols, with the protocols alternated across weekly treatment sessions. Although our initial hypothesis was that the richer context of scenario training would promote increased generalization compared to script reading, we found that both treatment protocols yielded similar degrees of improvement. Qualitative analysis of our data yielded an order effect in that script training appeared most beneficial when it preceded scenario training, but not vice versa. Continued exploration of our treatment protocol is warranted to evaluate optimal dosage and task content. Similar to previous treatment studies for severe aphasia, our protocols yielded improved expressive language in treated tasks for our participant but failed to trigger generalization to additional, untreated contexts. This study reinforces the need for functional, meaningful treatment protocols to best serve individuals with severe aphasia.

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Maximizing Generalization in Severe Aphasia: Script Reading Versus Scenario Training

Honors Capstone Project

Department of Allied Health and Communicative Disorders

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Faculty Supervisor: Jamie Mayer, Ph.D., CCC-SLP

Fall 2010 – Spring 2011

Abstract:

Background: Aphasia therapy is effective in terms of improvement of specific, treated items in a given context in order to restore as much language and cognitive processing as possible (Thompson & Worrall, 2008). Typically, the most difficult aspect of aphasia treatment protocols is generalization of treatment gains outside of the therapy room; this is particularly problematic for those with more severe aphasia.

Aims: The purpose of this study was to compare two treatment protocols, script reading versus scenario training, for an individual with severe aphasia to determine relative advantages of one type of intervention over the other. Whereas script training is traditionally limited to rehearsing conversational interactions, we designed a novel treatment approach, scenario training, to increase contextual relevance and hence generalization by rehearsing linguistic, motoric, and cognitive aspects of particular situations.

Methods & Procedures: A single-subject, multiple-baseline-across behaviors treatment design was used. To compare the treatment protocols, the participant selected three functional tasks most relevant to his daily life. Language for each task was trained sequentially using script versus scenario training, with the order of training alternated across sessions. Progress in each treatment protocol was gauged via the number of correct words produced spontaneously in response to probe questions at the start of each treatment session.

Outcomes & Results: Although our initial hypothesis was that the richer context of scenario training would promote increased generalization compared to script reading for an individual with severe aphasia, we found that both treatment protocols yielded similar degrees of improvement. Qualitative analysis of our data yielded an order effect in that script training appeared most beneficial when it preceded scenario training, but not vice versa.

Conclusions: Continued exploration of our treatment protocol is warranted to evaluate optimal dosage and task content. Similar to the majority of aphasia treatment studies, our protocols yielded improved expressive language in treated tasks for our participant but failed to trigger generalization to additional, untreated contexts. This study reinforces the need for functional, meaningful treatment protocols to best serve individuals with severe aphasia.

1. Introduction

"Aphasia is an impairment, as a result of a brain damage, of the capacity for interpretation and formulation of language symbols; multimodality loss or reduction in efficiency of the ability to decode and encode conventional meaningful linguistic elements" (Davis, 2007). Aphasia is disproportionate to impairment of other intellective functions which is not attributable to dementia, confusion, sensory loss, or motor dysfunction; and manifested in reduced availability of vocabulary, reduced efficiency in application of syntactic rules, reduced auditory attention span, and impaired efficiency in input and output channel selection (Davis, 2007). Aphasia rehabilitation is typically conducted initially within a medical environment but may eventually lead to any traditional daily setting where family members are able to assist the individual with aphasia (Davis, 2007). The goal of aphasia therapy is to be effective in terms of improvement of specific, treated items in a given context in order to restore as much language and cognitive processing as possible (Thompson & Worrall, 2008).

Typically, the most difficult aspect of aphasia treatment protocols is generalization of treatment gains outside of the therapy room; this is particularly problematic for those with more severe aphasia in which a richer context might be necessary to facilitate maximal generalization of treatment gains to everyday life (Lyon, 1998). Therefore, it has been suggested that clinicians working with individuals with severe aphasia train directly functional stimuli in functional contexts (Davis, 2007). One suggestion has been the inclusion of "functional" therapy protocol, conversational script training (Holland, 1988). Script training is a functional approach to aphasia therapy that uses written scripts to facilitate personally relevant conversational activities. For a given functional task, the clinician would write out a few simple responses that an individual would typically have in a daily conversation. Scripts should be written appropriately to meet the

client's cognition level, reading potential, and expressive language so that the client is able to read the script aloud with minimal assistance from the clinician. (See Appendix B. for Conversational Script Training Example: Telephone Script).

Scripts can guide identification of participants and actions that are required in particular social situations by providing the client with more knowledge of a given situation allowing recall of the temporal organization of events in routine activities (Holland, 2010). This type of treatment stands apart from traditional methods of treating individuals with aphasia in that this approach targeted communicative interactions between the client and his or her family members and friends, communication taking place at home rather than the clinic, and focuses on personal connections rather overcoming language dysfunction (Lyon, 1998). If the contextual nature of script training leads to improved functional outcomes for individuals with severe aphasia, it follows that further increasing the contextual richness of a treatment paradigm might provide even better outcomes regarding functional communication, auditory comprehension, and correct spontaneous expressive language in terms of (a) rate of mastery, and (b) amount of material mastered.

Seeing how script training is traditionally limited to rehearsing conversational interactions, we designed scenario training to increase contextual relevance by rehearsing linguistic, motoric, and cognitive aspects of particular situations. The methodology of this scenario training protocol was to maximize generalization by replicating a particular scenario to a controlled treatment room. This can be achieved by using creative materials including props, videos, volunteers, etc, in the treatment session so the client will have more visual cues associated with language of a given functional task. The self-designed scenario training treatment model stands apart in several distinct ways. First, it targets the shared communication

within the participant's family and friends daily functioning by reenacting a particular situation rather than focusing on language alone. Second, scenario training focuses on helping the individual with severe aphasia feel personally connected rather than just facilitating exchange of information (Lyon, 1998). Third, it provides an environmentally rich context by using supportive visual cues to maximize generalization from therapy to everyday life.

In summary, we tested whether a novel treatment paradigm, scenario training, would lead to improved treatment outcomes in terms of (a) rate of learning, and (b) amount of expressive communication for specific contexts, compared to conversational script training, for an individual with severe aphasia. We hypothesized that, compared to conventional script training; scenario training would enhance generalization for individuals with severe aphasia because of the increased the contextual richness of a treatment paradigm. Given this contextually rich environment, appropriate language use would increase as a result of greater comprehension (i.e., enhanced semantic network) and use of functional communication for a given situation. The increase in correct spontaneous words produced toward specific functional tasks should then lead to more rapid and global gains in expressive language.

2. Methods

2.1 Participant

Jxx is a 57-year old male, 18 months status post a large left-hemisphere CVA. Initially Jxx was diagnosed with severe, global aphasia which later resolved to severe Broca's aphasia (i.e., slight increase in auditory comprehension for very simple yes/no questions) by the time of this study.

2.2 Pre-treatment assessment

Prior to the initiation of our treatment protocol, Jxx was administered the following tests to gauge aphasia type and severity (Refer to Appendix A. Table 1 for scores).

2.2.1 ASHA-FACS, Functional Assessment of Communication Skills in Adults

The ASHA-FACS Assessment Tool is used to gauge an adult's functional communication status in the areas of speech, language, and cognition (Frattali, Holland, Thompson, Wohl, & Ferketic, 2011). This is done by assessing the functional communication in the four areas including: social communication; communication of basic needs; reading, writing, and number concepts; and daily planning (Frattali, Holland, Thompson, Wohl, & Ferketic, 2011). This test is administered to the client orally and may require the assistance of a caretaker or close family member to ensure accurate reporting.

2.2.2 Aphasia Diagnostic Profile – Picture Description Task

In this task, Jxx was shown a picture with multiple scenes and asked to talk about it. This test was used to get a sample of spontaneous expressive language/ connected speech sample with no assistance from the clinician.

2.2.3 Boston Diagnostic Aphasia Exam – Aesop's Fable

The portion of the Boston Diagnostic Aphasia Exam that was given to Jxx was the Aesop's Fables. In this section, there were 3-5 simple pictures used to tell one fable. The administrator of this exam would read a simple script aloud and point to the pictures as the story progressed. After the story had been told, the administrator asked Jxx to repeat the story aloud.

This exam was administered to once again get a sample of spontaneous expressive language/ connected speech sample.

2.2.4 Western Aphasia Battery (WAB)

The WAB was designed to identify aphasia types, severity, and language strengths/ weaknesses needed to establish a prognosis for therapy. This test can be administered to an individual continuously for about an hour long, which was done with Jxx, or separated over a few days for each section (Kertesz, 1982). The WAB consists of 8 subtests including: content, fluency, auditory comprehension, repetition, naming, reading, writing, and calculation (Kertesz, 1982).

Jxx was enrolled in outpatient speech-language therapy from 6 to 12 months post-stroke, during which time his WAB scores increased by 5 points (from 25.1 to 29.7): i.e., just short of "clinically significant change" (5.5 points, Shewan & Donner, 1988). Similarly, Jxx and his family noted little noticeable functional improvement during this time. Jxx participated in intensive, constraint-induced language training during the summer of 2010 with additional improvement in WAB scores (from 29.7 to 34.8) but again, little direct functional impact.

Both Jxx and family members displayed a high level of motivation to get Jxx back into treatment. Upon the termination of prior treatment procedures, Jxx was able to able to produce one to seldomly two word phrases when asked a simple question. The most beneficial skill that Jxx could learn through therapy, according to Jxx and family members was the ability to use functional expressive language on a daily basis. Both Jxx and family members wanted to continue working on Jxx's functional expressive language so that family and friends could have simple conversations with Jxx. In summary, Jxx has shown improvement from previous therapy interventions but little has been done to address generalization of information from therapy to daily functioning.

2.3 Study Design.

The intent behind this treatment design was to provide a motivated participant that has severe aphasia with as many resources as possible in efforts to reestablish natural spontaneous expressive language. Upon observing Jxx in a more traditional treatment protocol, it was clear to see that Jxx's cognition level far exceeded his ability to verbalize speech through his persistence in accurately producing expressive language. After saying a

word aloud, Jxx would continue to repeat the word until there was little to no error in articulating the word which demonstrates his recognition of that word.

The speech-language pathologists working with Jxx during this time had also noted that in a more traditional treatment design, Jxx had the most difficulty in generalizing information learned in the treatment session and applying it to a real life scenario. An example: When Jxx was shown a picture of a dog on a flashcard, Jxx could accurately verbally express that the item on the flashcard was a dog. After leaving the treatment session, Jxx's wife asked Jxx to label the dog on the sidewalk and Jxx could not.

At this point, a treatment approach was created to directly target the areas in which Jxx needed the most assistance based on the previous clinicians' reviews, to increase generalization from therapy to real life scenarios, and requests from Jxx and family members' to improve functional expressive language. Because Jxx's had such a high willingness to participate in therapy and enthusiasm to produce speech orally, Jxx was a perfect candidate to partake in a student designed, novel treatment approach of scenario training. The rationale in creating this unique design was that by giving Jxx an enriched situation specific scenario to learn appropriate language for that scenario, generalization would be maximized. In order to see if this novel treatment protocol would indeed maximize generalization and increase spontaneous expressive speech for individuals with severe aphasia compared to a more traditional treatment approach; it needed to be tested using a single-subject, multiple-baseline across behaviors design.

2.4 Probe Tasks

At the start of each treatment session, Jxx was asked a series of questions related toward specific functional tasks such as using the telephone, responding to an emergency, etc., to measure Jxx's accurate spontaneous, expressive language abilities. To optimize the research results, three probes were used to compare these two treatment protocols, script reading and scenario training. (Appendix C: Template of Probe Questions including Exposure Probe)

2.4.1 Treatment Probes

The treatment probes consisted of three sets of three questions relating to a particular functional task targeted during this treatment protocol. The three functional tasks targeted during this treatment protocol were: using a telephone, responding to an emergency, and ordering a meal. The treatment probes were administrated at the start of each session to measure gain in the amount of correct spontaneous expressive speech after a particular functional task has been targeted.

2.4.2 No-Treatment Probe

The no-treatment probe was designed to identify potential practice effects with the probes questions themselves. At the start of each week, the no-treatment scenario household instructions questions were administered even though this particular functional task was not targeted during this treatment protocol.

2.4.3 Exposure Probe

The exposure probe design was administered to test gain in spontaneous correct speech for a particular functional task if the task had not been targeted throughout treatment. The exposure probe, making an appointment scenario was used during the baseline and final treatment session in addition to the treatment probes and the no treatment probe.

2.5 Treatment Protocol

Jxx received 90-minute weekly therapy sessions over a 10-week period, with additional homework instructions depending on the treatment protocol for that week. The two treatment protocols, script reading and scenario training were alternated every other treatment session (Table 2). Three scenarios were trained using both methods with order of training systematically varied between training methods (Table 2).

Following Holland 2010, the script training procedures involved the following steps: first, the clinician provided scripts appropriate for clients' language abilities (e.g., for Jxx, 1-4-word phrases) and life contexts. Next the script(s) were rehearsed with the client at a slower than normal rate so that the client could effectively learn how to produce the script(s) aloud with minimal assistance. The client then produced the scripts accurately, ideally with no cueing from the clinician. After this point, the client was encouraged to practice the script(s) often so that the phrases are said more clearly and may become committed to memory. For this treatment design however, the script reading homework required Jxx to practice reading the functional task script(s) aloud with the assistance of a prerecorded digital recorder three times a week required but with the recommendation to practice as often as

possible. The focus of the script reading protocol was to produce appropriate responses given a particular context with little to no error (Holland, 2010).

The student inspired design of scenario training was made to meet the needs of Jxx's strengths and weaknesses by making an enriched environment for Jxx to learn appropriate language for a particular situation. The clinician provided additional resources and materials to expose Jxx to a particular contextualized environment, which is critical for this method. This procedure encourages as "rich" a context as possible by using materials such as videos, pictures, toys, or volunteers pertaining to a specific functional task. The interactions between the client and clinician in this method were conversational in nature, such that the client is an equal partner in language expression as suggested by Davis, 2007. The focus of this protocol is to aid comprehension of a particular situation by immersing the client in that context while eliciting accurate language (Table 2).

For the scenario treatment protocol homework, Jxx needed the assistance of family and friends. Jxx was required to practice using spontaneous appropriate speech for a particular situation by actually physically engaging in the real life scenario. Family members and friends were not allowed to speak for Jxx but they were responsible for taking Jxx safely to the specific scenario for the week at least once but it was recommended to practice as often as possible. In addition to that, Jxx was also responsible for reviewing any/all materials that was used during the treatment session for the week such reviewing flashcard, reading the order of actions to take in an emergency, etc.

3. Results

3.1 Pre-treatment versus post-treatment testing (Table 1)

This treatment design demonstrated the complex relationship between treatment, pre- and post-test, and probe measures, as well as patients' and families' perceived improvement. Similar to previous research, Jxx demonstrated situation-specific gains with little to no change in more generalized measures of language over the course of this study.

3.1.1 ASHA-FACS, Functional Assessment of Communication Skills in Adults

The ASHA-FACS scores increased in overall Communication Independence and Qualitative Dimension through the course of this treatment protocol. Jxx's family noted improvement in daily communication as his wife reported that this was the first time Jxx had given a (scripted) four word response since the stroke.

3.1.2 Aphasia Diagnostic Profiles – Picture Description Task

The more generalized assessment tool of the picture description task had little noticeable change for the pre- to post test scores because of the non-targeted language during treatment.

3.1.3 Boston Diagnostic Aphasia Exam – Aesop's Fables

The results from the Aesop's Fables yielded similar results to the picture description task in which there was little noticeable change for the pre- to post test scores.

3.1.4 Western Aphasia Battery

Again the results from the Western Aphasia Battery Test showed little noticeable improvement as this test dealt with non-targeted language.

3.2 Within-treatment performance

Each treatment protocol entailed different advantages. During the conversational script training, Jxx was able to express appropriate 4-5 word responses through practice and memorization of scripts. The family members later designed their own scripts for Jxx to use for other daily tasks because of the expressive improvement seen during treatment. During the less scripted scenario training, Jxx often used nonverbal means (e.g., gesture) to engage with others in trained situations, demonstrating enriched comprehension. Jxx unexpectedly appeared to combine the two treatment protocols to his advantage, by using the rehearsed scripts as a catalyst for expression in scenario training.

3.3 Probe performance – baseline stability

A slight increase in accurate responses was noted during the baseline period. Once each functional context was specifically targeted in treatment, visual inspection

showed the number of correct words produced spiked in comparison to the baseline (Figure 1).

3.4 Probe performance – maintenance effects

Accurate responses for a particular context declined after the initial spike following the targeted treatment, yet continued to remain higher than baseline performance (Figure 1).

3.5 Probe performance – order effects

The data revealed little noticeable change in performance during functional contexts treated initially with script versus scenario training; that is, similar successful results were obtained regardless of the order of training techniques (Figures 1 and 2). On a subjective basis, however, clinicians felt that practicing conversational script training first facilitated application of the rehearsed scripts to scenario training.

3.6 Probe Task Performances (Figures 1 & 2)

The two control probe tasks, exposure probe and no-treatment probe were included in the treatment design to measure Jxx's improvement in (a) no exposure to functional task probe questions throughout treatment or scenario training for a particular functional task, and (b) exposure to functional task probe questions throughout treatment with no exposure to particular functional task. These controls were included to compare pre- and post-treatment test scores, and to provide a comparison for within-treatment progress and probe performance.

3.6.1 Treatment Probes

Jxx demonstrated substantial improved performance in the treatment probes (Contexts 1-3) in number of correct words produced spontaneously in response to functional context questions after the particular functional context had been exposed.

3.6.2 No-Treatment Probe

Visual inspection of the data from the no-treatment probe demonstrated a slight gain in the number of correct spontaneous responses of up to1-3 words. The no-treatment probe, a set functional task questions asked every week without being targeted during treatment (Context 4), is representative of the learning effect on Jxx in having the clinician repeat the same functional tasks questions week after week.

3.6.3 Exposure Probe

The exposure probe (Context 5), presented at baseline and final treatment session revealed no change in gain of spontaneous correct speech.

4. Discussion

In the current study, two treatment protocols, script reading and scenario training were compared to determine which intervention type had relative advantage at maximizing generalization for an individual with severe aphasia. Purposes of this study were to not only to maximize generalization but to also increase correct expressive language relating to a particular topic, provide rich contextual relevance to aid in comprehension of particular situations including topic related semantics, and help those individuals with severe aphasia feel personally connected to the family and friends supporting them. Following a 10 week, single-subject, multiple-baseline across behaviors design, Jxx demonstrated improved number of correct spontaneous words produced in response to functional context questions. Our initial hypothesis was that the richer context of scenario training would promote increased generalization compared to script reading for severe aphasia, yet upon reviewing the results, the most significant improvements were demonstrated at the conclusion of both treatment protocols for a given functional task. Both Jxx and the clinician found a natural progression in using the rehearsed scripts as a catalyst of expression for scenario training.

This study also demonstrated the complex relationship between treatment, pre- and post-test, and probe measures, as well as patients' and families' perceived improvement. Similar to previous research, Jxx demonstrated situation-specific gains with little to no change in more generalized measures of language (i.e., the WAB and BDAE subtests) over the course of this study. A visual inspection of the probe data demonstrated situation specific gains after a particular functional task had been targeted in treatment. Through this counter-balanced treatment design approach, both the clinician and Jxx discovered that the order of the treatment protocols had made the difference in terms time efficiency of the treatment sessions. Script

reading followed by scenario training seemed to flow much smoother because Jxx had used the information learned from the script reading almost as a word bank when searching for appropriate language for the scenario training. Using both of these treatment protocols together has shown through the probe question results to enhance generalization and increase the number of spontaneous expressed words used for a particular situation. In addition to these gains, Jxx also improved his articulation for the words used in the predetermined scripts.

The family centered treatment model successfully encouraged the family members to have an active role in Jxx's treatment. Since the functional tasks were relevant to Jxx's daily life, the family was able to clearly see the benefits of therapy; as reflected in ASHA FACS scores. Jxx's wife had stated to the clinician that she felt the relationship between her and Jxx has been greatly improved. Now that Jxx's wife has the means to communicate with her husband through creating and rehearsing conversational scripts that is most relevant to their daily lives, quality of life for each has improved. The wife had also reported that Jxx is now able to produce 4-5 word phrases which are a first since the stroke.

For individuals with severe aphasia, the importance of expressing language that is relevant to his/her personal life cannot be understated. The perceived language improvement, of an individual with severe aphasia, from family members and friends has a significant impact on the management of their daily lives. Although further controlled studies are required, our findings provide preliminary support for functional treatment protocols that increase contextually relevant expressive language among individuals with severe aphasia.

Acknowledgements

Special thanks to Jxx and his family members for their patience, enthusiasm, and perseverance during participation in this study.

Appendix A. Results: Tables 1 & 2, and Figures 1 & 2

Table 1: Selected Pre- and Post- Treatment Test Scores

Assessment Tool	Pre-Test Scores		Post Test Scores	
ASHA-FACS	Social Communication Score	4.86	Social Communication Score	5.14
	Communication of Basic Needs	6.14	Communication of Basic Needs	6.42
	Reading, Writing, Number Concepts	4.60	Reading, Writing, Number Concepts	5.00
	Daily Planning	5.60	Daily Planning	5.60
	Overall Communication Independence Mean Score	**5.30**	Overall Communication Independence Mean Score	**5.54**
	Adequacy	3.5	Adequacy	4.0
	Appropriateness	4.0	Appropriateness	4.5
	Promptness	3.5	Promptness	4.0
	Communication Sharing	2.0	Communication Sharing	3.0
	Overall Qualitative Dimension Mean Score	**3.25**	Overall Qualitative Dimension Mean Score	**3.88**
	Initial Assessment 10/2010		Final Assessment 11/2010	
Picture Description Test	# Correct Words Expressed Independently	**5**	# Correct Words Independently	**6**
	Initial Assessment 10/2010		Final Assessment 11/2010	
Aesop's Fables (BDAE)	# Correct words/Total words expressed	3/11		
	Pre-CIAT Assessment 6/2010			
	# Correct words/Total words expressed	3/16	# Correct words/Total words expressed	5/19
	Post-CIAT Assessment 8/2010		Final Assessment 11/2010	
Western Aphasia Battery	WAB AQ	29.7		
	Pre-CIAT Assessment 6/2010			
	WAB AQ	37.2	WAB AQ	31.4
	Post-CIAT Assessment 8/2010		Final Assessment 12/2010	

Table 2: Treatment Protocols and Procedures

Treatment Protocols and Procedures		
Date	**Treatment Protocols**	**Procedure**
Week 1	Initial Assessment - Telephone Introduction	Discussion of treatment design with family; Jxx chose functional tasks most relevant to normal daily function; Administered initial assessment - ASHA FACS with the assistance of family members; Introduced the Telephone Script and assign homework for the week (which should be practiced once a day).
Week 2	Telephone - Script	Discussed the purpose of treatment session; Shared with Jxx and his family members the functional tasks that sessions will focus on throughout treatment; Administered picture description test; Administered probe questions that ask questions relevant toward each functional task including the exposure probe; Practiced producing the telephone script with as minimal cueing necessary for clinician to produce the script accurately; Reviewed how to use voice recorder for homework assignment; Homework - Read Telephone Scripts with the voice recorder once a day.
Week 3	Telephone - Scenario	Discussed the purpose of the treatment session; Administered the probe questions; Quickly reviewed the telephone script with the Jxx; Jxx practiced using the script with a live person on the other line of the phone using a corresponding script; As Jxx became more comfortable having the person on other line asking questions - the conversation became more realistic and less rehearsed; Homework for the week relied on the assistance of family members to practice with Jxx using the telephone and scripts as a guide.
Week 4	Introduction to Emergency Response	Discussed the purpose of the treatment session; Administered the probe questions; Asked Jxx to give a list of emergencies assisting if needed; The clinician recorded the list of emergencies that Jxx came up and added more traditional emergencies if necessary; Jxx and clinician practiced saying the list aloud; Used flashcards to identify what is an emergency; Reviewed which situations would consider calling 911; Reviewed the definition of an emergency and their qualities; Discussed steps that would be taken in response to an emergency; Created different emergency scenarios such as fire, medical emergency, etc and discussed what Jxx would do in that situation step by step; Homework for the week was to review the emergency flashcards and practice repeating most frequent emergency responses such as "call 911."
Week 5	Emergency - Scenario	Discussed the purpose of the treatment session; Administered the probe questions; Reviewed the different types of emergencies by first writing them down then reviewed the emergency flashcards; Exposed Jxx to contextualized environments of different emergencies by using video to demonstrate different emergency situations; Used atypical materials such as: toy houses, vehicles, and people to demonstrate emergencies; Had Jxx first show what to do in a given situation then had Jxx try to verbalize what to do; Made a list of what to do if in certain emergency situations; Briefly practiced the emergency response script; Homework relied on the family members asking Jxx what should be done if presented with an emergency as well as reviewing the emergency response script.
Week 6	Emergency - Script	Discussed the purpose of the treatment session; Administered the probe questions; Reviewed different types of emergencies and the qualifications of an emergency; Reviewed the emergency flashcards briefly; Practiced reading multiple emergency response scripts that are relevant to common emergencies for Jxx with as minimal assistance necessary from the clinician; Homework strictly practiced reading aloud the emergency response scripts with the voice recorder.
Week 7	Ordering a Meal - Script	Discussed the purpose of the treatment session; Administered the probe questions; Asked Jxx to make a list of favorite foods and practice repeating them; Reviewed three of Jxx's favorite restaurant menus and highlighted Jxx's favorite choices; Practiced reading the favorite choices at each restaurant; Practiced the ordering a meal script; Homework practiced repeating Jxx's favorite meal choices and ordering a meal script with the prerecorded voice recorder.
Week 8	Ordering a Meal - Scenario	Discussed the purpose of the treatment session; Administered the probe questions; Reviewed the ordering a meal script and restaurant top choices; Showed a video of ordering fast food versus a sit down restaurant; Role-played ordering a meal at a restaurant with materials to recreate the scenario; Jxx practiced ordering a meal at the three favorite restaurants with the top choices from each; Homework relied on the assistance of family members to take Jxx to restaurants and encourage Jxx to order a meal with as minimal assistance necessary while also practicing the ordering a meal script.
Week 9	Final Assessment	Administered the following final assessment procedures: probe questions, picture description task, portion of the Boston Diagnostic Aphasia Examination, ASHA FACS with family member assistance; Provided Jxx with all of the scripts throughout the entire treatment protocol to use as a reference.
Week 10	Final Assessment	Administered the following final assessment procedures: probe questions with exposure probe and the Western Aphasia Battery Test; Provided alphabet flashcards with pictures for Jxx to practice phonemes outside of therapy.

Figure 1: Treatment Baseline and Probe Results

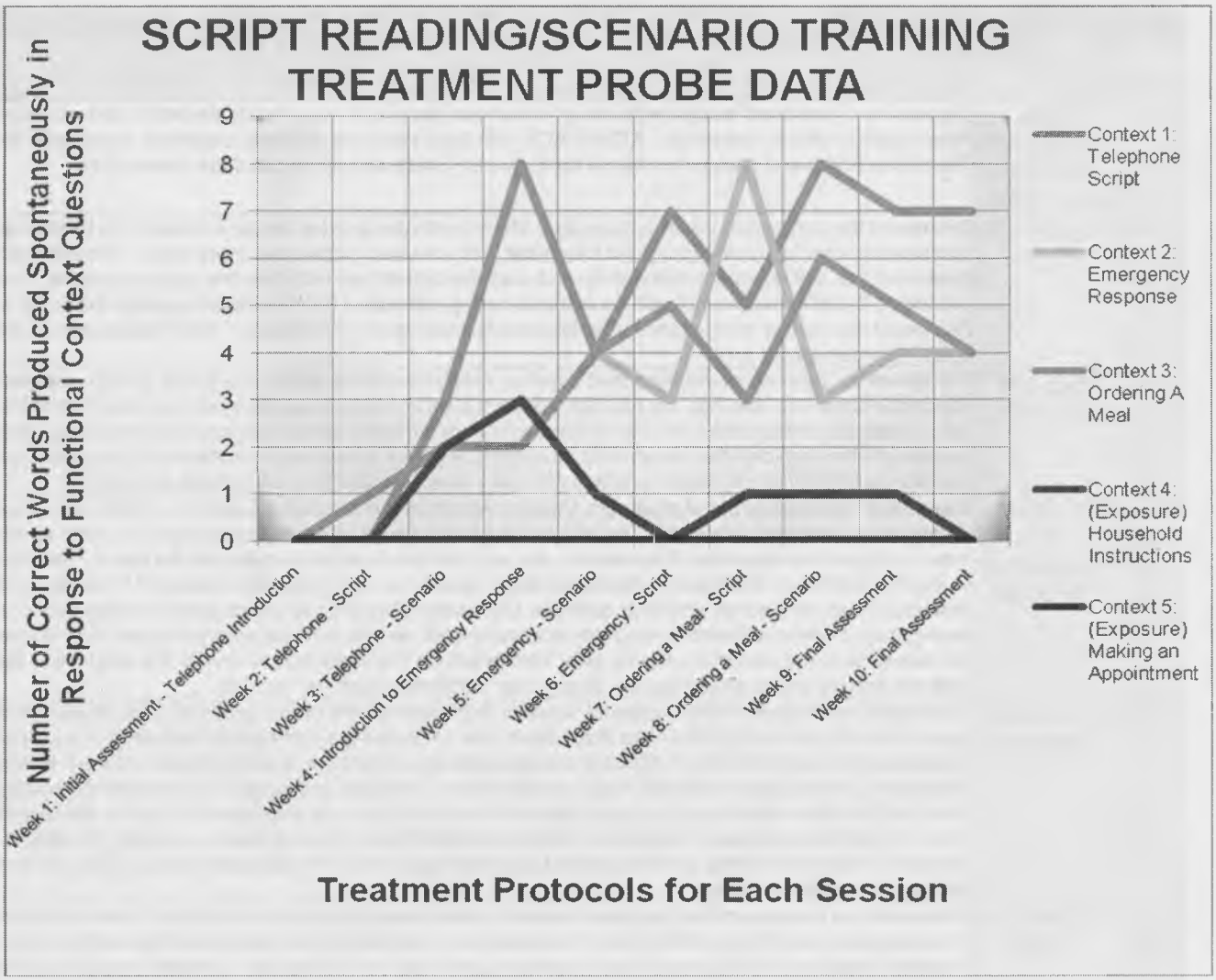

Figure 2: Functional Tasks Practiced with Probe Responses

Functional Tasks Tested with Probe Responses	*Week 1: Initial Assess*	*Week 2: Script*	*Week 3: Scenario*	*Week 4: Intro*	*Week 5: Scenario*	*Week 6: Script*	*Week 7: Script*	*Week 8: O Scenario*	*Week 9: Final Assess*	*Week 10: Final Assess*
Context 1: Telephone Script	-	0	3	8	4	7	5	8	7	7
Context 2: Emergency Response	-	0	2	2	4	3	8	3	4	4
Context 3: Ordering A Meal	-	1	2	2	4	5	3	6	5	4
Context 4: (Exposure) Household Instructions	-	0	2	3	1	0	1	1	1	0
Context 5: (Exposure) Making an Appointment	-	0	-	-	-	-	-	-	-	0
Context Being Used	Telephone Script Practiced			Emergency Response Practiced			Ordering A Meal Practiced		Final Assessments	
Treatment Session Dates	27-Sep	4-Oct	11-Oct	18-Oct	25-Oct	1-Nov	8-Nov	15-Nov	22-Nov	3-Dec

Appendix B. Conversational Script Training – Example: Telephone Script

Telephone Script

Functional Task #1

1. Hi, it's Jxx.

2. I'm fine.

3. How are you?

4. Chris is not home.

5. Please call back later.

6. Goodbye!

Appendix C. Template of Probe Questions including Exposure Probe

SCRIPT READING/SCENARIO TRAINING TREATMENT PROBE QUESTIONS

Week/Date of Treatment: __/__/_____

Contextual Probe Questions	Client's Response *Probe Measurement: Number of correct words produced spontaneously* *Correct Responses Highlighted	Total Number of Words Produced
Context 1: Telephone Script **1)** What do you say when the telephone rings? **2)** Once you say "Hi," what do you say next? **3)** Who calls you and why?	**1)** **2)** **3)**	
Context 2: Emergency Response **1)** What would you do in an emergency? **2)** After you have called 911, what do you do next? **3)** Name some emergencies?	**1)** **2)** **3)**	
Context 3: Ordering A Meal **1)** What do you say when you order a meal? **2)** After you pick the food you want, what do you do next? **3)** What are your favorite foods?	**1)** **2)** **3)**	
Context 4: Household Instructions **1)** What are some things in your house you use? **2)** How do you use a microwave/oven? **3)** How do you use washing machine?	**1)** **2)** **3)**	
***Context 5: Making An Appointment** **1)** What kinds of appointments do you need? **2)** What do you need to make an appointment? **3)** How do you make an appointment?	**1)** **2)** **3)**	

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